

Analysis of the Potential Determinants of Foreign Direct Investment: Empirical Evidence from Thailand

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Abstract

This study analyze the main determinants of FDI in Thailand by applying the ordinary least square (OLS) technique to analyze the secondary time series data for a period of study which starts from the year 1988 to 2015 chosen basing on the data availability. The results obtained showed that the main determinants of FDI in Thailand are infrastructure development (lnINFRAR), Market size (lnRGDP), Corruption (lnCORUP) and GDP growth (lnGDPGR) which were all significant at 1 percent level and had the sign as expected basing on economic theories. These findings are in line with many other previous studies on the related subject. Therefore the Thai government is recommended to expand its market size, improve its infrastructure level, boost its economic growth and curb its level of corruption so that more FDI can enter in its economy. However it is also recommended that the results of this study should be interpreted with care until further studies are conducted with more variables and apply other reliable econometric techniques.

Keywords: Foreign direct investment (FDI), Ordinary Least Square (OLS), unit root, Thailand.

1. Introduction

From the very long time FDI has been one of the most good solution in the host country by creating jobs, increasing the managerial skills, capital accumulation; accelerate the export growth, improving the technology and act as a catalyst for economic growth etc. Hence, it becomes important to study the determinants of FDI inflows. Since such studies have some implications for FDI policy making which can be applied on the general economic development.

In recognizing the benefits that FDI can bring to the host country, Thailand has not been left behind in attempt to attract the level of FDI in its economy.

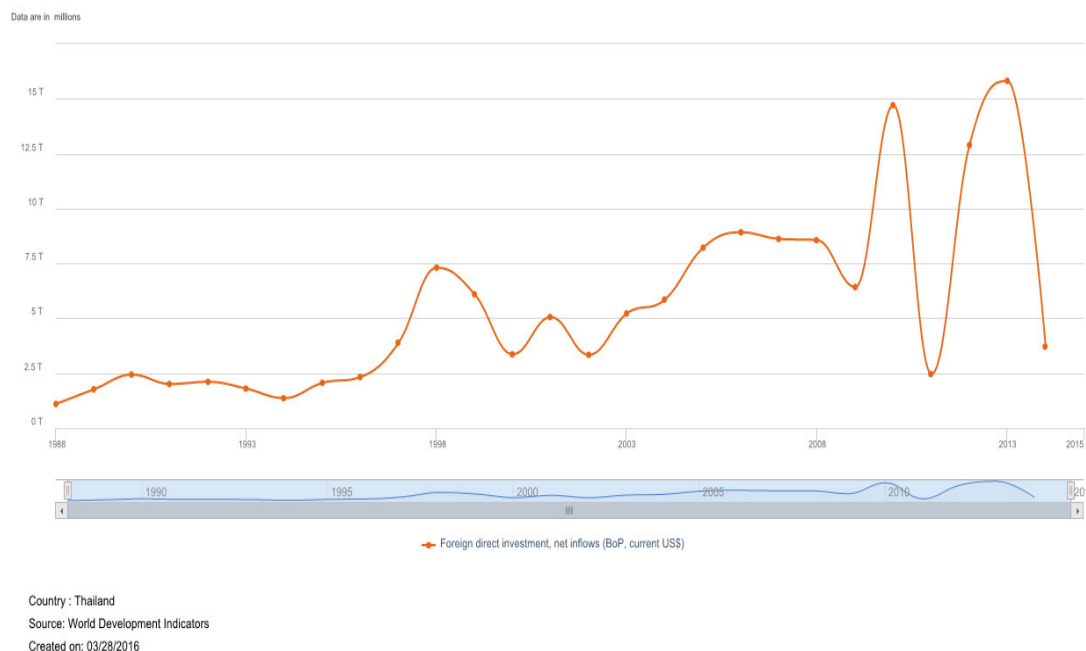
That has been done by improving its investments climate which includes establishing the investments departments which is responsible in dealing with investment matters such as creating a more conducive investment climate for potential investors in the country.

Although there many studies which have been conducted concerning the determinants of FDI in developing countries particularly Thailand and other Asian countries with most of them conducting the comparative cross-country studies. Still the Studies focusing on FDI in Thailand specifically are limited. So far most of these studies conducted are basing on the survey and descriptive analysis while the empirical studies remain to be limited.

Research questions: Since 1988 the level of FDI in Thailand has been subject to several fluctuations in its economy (figure 1) which led us to come up with a question why so? And what are really main determinants of FDI in Thailand?

Below in the figure to show the FDI trends from the year 1988 to the year 2015

Figure 1: FDI Trends in Thailand 1988-2015 (million usd)



Thailand has been experiencing the high fluctuations in the level of FDI inflow despite the major effort done by the government to stabilize the situation. Thailand FDI trends is shown from the figure1 below where it can be observed that the level of FDI has been very low amounting 1,105.4 to 2,443.5 million from the year 1988 to 1990 respectively where it became steady until the year 1998 where it was high and fell again probably due to the Asian financial crisis, FDI continued to be low and fluctuated until the year 2005 where it reached 8,222.8 million usd and remained stable until the year 2008 where it fell again to reach 6,427.3 million usd in the year 2009 which is believed that could have been influenced by the world financial crisis .

The year 2010 Thailand experienced the highest level of FDI again amounting 14,714.9 million usd but only on that year it fell again sharply to its lowest level amount of 2,468.1 million usd in the year 2011 then immediately rose again in the year 2013 to reach its highest level amount of 15,822.1 million usd and fell again in the year 2014 sharply to reach its lowest level amounting 3,718.7million usd in the year 2015 which could have been attributed by the political situation in Thailand when the military took over the government.

Objective of the study: The main objective of this study is to identify the main factors that can significantly influence FDI inflow to Thailand .The Specific Objectives of the study is to estimate these factors and analyze their relationship on FDI in Thailand then proposes new policy recommendation basing on the results obtained in order to improve investment climate in Thailand so that more FDI can be attracted from abroad.

Significance of the study: The main significance of this study is to make further contributions in the study of FDI in Thailand and also opening up a way for other students who are undertaking studies on FDI. Providing a better knowledge and understanding of the factors that affect FDI inflow in Thailand

The scope and limitation of the study: The study covers only Thailand as one country with the period of study Between1988-2015 which was selected basing on the data availability. The techniques applied (OLS) is a very simple technique to be applied which despite the fact that it can give out a meaningful results still suffers several setbacks than other new developed techniques hence the results obtained should be cautiously interpreted.

Organization of study: This study is organized as follows; the first part provides the introduction followed by review of the relevant literature in part two. The methodology of the study is covered in part 3, while part 4 covers data analysis, the discussion and interpretation of results. Part 5 makes conclusion with the policy recommendation and future further studies recommendations.

2.0 Literature Review

Many past studies exist on determinants of FDI. This study only mentions a few selected literatures on the subject as follows below. The studies of Masayuki and Ivohasina (2005), Laabas and Abdmoulah (2008), Bellak.et.al (2008), Kimino.et.al (2007), Nguyen and Nguyen (2007), Kristjandottir (2005), Benassy-Quere.et.al (2005), Farrell.et.al (2004) and Liu.et.al (1997) have indicated how the market size as one the best determinant FDI. With only few past studies who indicated the market size had a negative effect on FDI.

Studies by Kimino.et.al (2007), Farrell.et.al(2004), Banga (2003), Zhao(2003), Kiyota and Urata

(2002), and Liu et al (1997) has shown that exchange rate have a significant effect on FDI other studies such as that of Masayuki and Ivohasina (2005) on FDI have showed that the exchange rate is one of the variable which have effect on FDI stating that the depreciation of exchange rate attracts more FDI. On the contrary Kathryn et al (1995), found no statistically significant effect between the exchange rate and FDI. While the studies by Benassy-Quere et al. (2001) found an ambiguous relationship of exchange rates on FDI inflows.

Asiedu L. (2006) analyzing the FDI in Africa found out that the Market size, Infrastructure development, inflation are the main determinant that attracts FDI inflow.

Shawa, M.J and Yao Shen (2014), analyzed the Major Determinants of Foreign Direct Investment using the ordinary least square method and his result showed that the market size, infrastructure development are the major determinants of foreign direct investment inflow to Tanzania. Furthermore Shawa M.J (2015) in his final dissertation on FDI to the five EAC countries namely Tanzania, Kenya, Uganda, Rwanda and Burundi respectively analyzed the panel data and discovered that the market size, trade openness, infrastructure development all have a positive significant effect on FDI while the exchange rate was found to have a negative significant relationship with FDI.

Xiao Ling Huang et al (2014) analyzed the factors that Influence the Chinese Firms' decision making in Foreign Direct Investment in Thailand. In their analysis they discovered that the Locational factors such as sophisticated infrastructure, Upgraded communication, IT networks and social factors such as the education level of labor force, "guan xi", Foreign friendly and harmonious society are the main factors influencing Chinese FDI in Thailand.

Yang et al (2000) examined the determinants of FDI in Australia using quarterly data between the year 1985-1994. With FDI expressed as a function of interest rate, wage costs, openness of the economy, real gdp, exchange rate, wage costs etc and find that interest rate, wage costs, openness of the economy are the main important factors determining FDI in Australia

Erdal and Tatoglu (2002) analyzed FDI determinants in turkey for a year between 1980-1998. Their results shows that the market size, the infrastructure and openness of trade all have attraction on FDI in turkey while the exchange rate and economic stability were found to have a negative effect on FDI.

Thunnell (1977) on his analysis on FDI found that foreign investment in a country decreased when it was politically unstable and increased when it was stable. On the contrary to others bennet and Green (1972), Wheeler and Mody (1992) found that the FDI in United States of America was not affected by political instability in recipient countries while Asiedu (2002) finds that neither political risk nor expropriation risk has a significant impact on FDI. The Basi and El-Haddad studies found that political instability strongly influenced the investor's decision to go abroad, as did the host government's attitude to FDI.

The role of GDP growth in attracting FDI has been observed by many authors such as Bandera and White (1968), Lunn (1980), Culem (1988), Schneider and Frey (1985), and Billington (1999). While Ang (2008) finds that GDP growth rate had a small positive impact on the inflow of FDI.

Studies of the impact of corruption on FDI are very scarce. Few studies such as that of Wheeler and Mody (1992) found no significant relationship between FDI and corruption level in the analyzing FDI location selection by American firms, this finding was in line with that conducted by Hines (1995). Based on the analysis of FDI by American firms and the level of corruption in host countries Hines' (1995) showed an overall insignificant effect of corruption on FDI but a significantly negative impact of corruption on FDI from United States after 1977. On the contrary Gastanaga et al. (1998) examined the link between corruption and FDI. They found out that lower corruption levels are associated with higher FDI.

On going through different literatures of the past studies, this study came up with just few selected variables that were relevant in affecting foreign direct investment in Thailand economy basing on their availability.

3.0 Methodology

This study used the Ordinary Least Square method (OLS) to analyze the data. The main reason of using this technique is due to the fact that it is one of the simple techniques in econometric to use in analyzing the data which have been used in a many previous empirical studies and bring a reliable results if properly applied. All the data used in this study have been transformed into a natural logarithm denoted as "ln" to avoid the inefficient and unreliable results which is the main problem in most time series data Karagol (2006) except for the dummy variable. The use of the natural logarithm will enable us to get unbiased and better empirical results in the form of elasticity Sezgin (2004). Hence our model is as specified as below.

3.1 Model Specification:

$$\ln TFDI_t = f(\ln RGDP, \ln EXRT, \ln INFRAR, \ln HC DL, \ln GDPGR, \ln CORUP, POLTI, \epsilon) \quad (1)$$

$$\ln TFDI_t = \beta_0 + \beta_1 \ln RGDP_t + \beta_2 \ln EXRT_t + \beta_3 \ln INFRAR_t + \beta_4 \ln HC DL_t + \beta_5 \ln GDPGR_t + \beta_6 \ln CORUP_t + \beta_7 POLTI_t + \epsilon_t \dots (2)$$

Where:

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$.

Are the coefficients of the estimated independent Variables.

“Ln” denotes the natural logarithm while the ϵ denotes the error term.

lnTFDI= Foreign direct investment in Thailand, lnGDPGR = Gross domestic product growth rate, lnRGDP=Market size, lnEXRT = Real Exchange rate, lnHCDL= Human capital development, lnCORUP = Corruption, lnINFRAR= Infrastructure development, POLTI=Political Stability ϵ = Error term.

3.2 Hypothesis of the Study and Explanation of the Variables

The variables included in our model are explained in turn with the sign expected and the proxies used: Market size, GDP growth, Real exchange rate, Human capital development, Corruption, Infrastructure development and political stability.

Market Size (lnRGDP)

The market size implies that a large market is necessary for the efficient use of resources and exploitation of economies of scale. Most of the empirical literature is mostly in favor of a positive relationship between the market size and FDI. Hence in this study we measure the market size by real GDP per capita like other past studies and we expect a positive relationship with FDI.

Real Exchange Rate (lnEXRT)

A weaker currency is not good for attracting the FDI but the strong one. The real exchange rate of the US dollar against the baht is used to measure the exchange rate risk. We expect a negative relationship between the exchange rate and FDI flows.

GDP growth (lnGDPGR)

A higher economic growth rate is good indicator of development potential in the economy. A faster growing Market tends to attract more inflow of FDI. In this case we expect a positive relationship between inflow of FDI and GDP growth in Thailand.

Infrastructure Development (lnINFRAR)

The infrastructure development indicates how difficult and costly to do business in the hosting country. The more developed the infrastructure such as roads, railways, airports, telecommunications the easier the access to markets and the lower the will be the transportation costs and, thus, the greater the chances for investors to invest in that country. It comprises roads, ports, telecommunications, and railways etc. We measure infrastructure development as the production of electricity. We expect a positive relationship with FDI.

Human Capital Development (lnHCDL)

The decision for foreign investors is determined by the quality of the labor existing in the hosting country. Countries where labor force highly skilled, could find it easier to it compete with other countries in attracting the higher level of FDI. A more educated labor force can learn and adopt new technology faster, and the cost of training local workers would lower for the investors. We measure the quality of labor by the secondary enrolment ratio .we hypothesize a positive relationship between human capital and FDI flows.

Political Stability (POLTI)

The political stability is important in creating a good environment and confidence for foreign investors to invest in the hosting country. While the instability could have a negative impact in attracting the level of FDI as it creates uncertainties, risks which could lead to the high costs of doing business in the hosting country. We use a dummy variable to measure the effect of political risk on FDI and expect that the unstable political situation to have a negative effect on FDI. This variable takes a value of “1” when the political situation is unstable and takes “0” otherwise.

3.3 The Data Source

This study has used the annual secondary time series data which covers the period between 1988-2015. This period has been chosen because data to be used for the FDI function of Thailand was easily available. The equation is estimated using the ordinary least square method for a 28-year period (1988 – 2015). Unless otherwise specified, all the data will be drawn from the various publications, International Financial Statistics Year Book, Bank of Thailand, The World Bank indicators (2015), Thailand bureau of statistics, publications and websites.

3.4 Estimation of Data, Results and Discussion

Ordinary least square technique is used in this study due to its simplicity, convenience and the fact that it has been successfully used by other studies and gives out meaningful results. The parameters obtained using this OLS technique is best, linear and unbiased (BLUE) but before applying this method all the data have to be checked for stationarity.

3.4.1 ADF Unit Root Test.

To ensure that the equations we estimate are not spurious it is important to test for Non stationarity, unless we are sure that all the variables are stationary then in that case we need not to worry about spurious regression. The Unit root test is in fact the approach that is mostly applied to perform the stationary tests.

The preliminary results of the augmented Dickey-Fuller (ADF) test employed by Dickey and Fuller (1979) are shown in Table 1. The results indicate that some variables were stationary at levels while others have to be differentiated to become stationary only after the first difference. In this case we have the mixed variables with both I(0) and I(1). The variables that were stationary in their levels are such as foreign direct investment, Gdp growth, Human capital development and political stability while those that were stationary only after the first difference are such as market size, Openness of the economy, Corruption, Infrastructure development and Real exchange rate. (see table 1).

Table 1: Unit root Test Result (ADF) Trend & Intercept

Variable	ADF-Stat & Probability	Order of integration
lnTFDI	-4.161784 (0.0148)**	I(0)
D(lnCORUP)	-5.784495 (0.0005)***	I(1)
D(lnEXRT)	-3.751441 (0.0364)**	I(1)
lnGDPGR	-6.093691 (0.0002)***	I(0)
lnHCDL	-4.140222 (0.0166)**	I(0)
D(lnINFRAR)	-5.788625 (0.0004)***	I(1)
D(lnRGDP)	-3.756383 (0.0361)**	I(1)
POLTI	-5.592548 (0.0005)***	I(0)

Source: Analysis of data from E-VIEWS 8.0

Note:

***, **, and * indicate 1 percent, 5 percent, and 10 percent significance level, respectively. Figures in parentheses are probability value. I (0) =Stationery at levels, I (1) =Stationery after the first difference.

3.4.2 Ordinary least Square (OLS)

The ordinary least square method was applied and the results were presented as follows below.

Table 2: Dependent variable lnTFDI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(lnRGDP)	4.339128	1.469836	2.952118	0.0079
D(lnINFRAR)	3.540998	1.345028	2.632658	0.0160
D(lnCORUP)	4.381230	1.128638	3.881874	0.0009
D(lnEXRUS)	0.616555	1.061920	0.580604	0.5680
lnGDPGR	0.489248	0.118793	4.118503	0.0005
lnHCDL	-1.222400	1.004069	-1.217446	0.2376
POLTI	-0.089072	0.220278	-0.404361	0.6902
C	60.22159	24.51128	2.456893	0.0233

Source: Analysis of data from E-VIEWS 8.0

Notes: ***, **, and * indicate 1 percent, 5 percent, and 10 percent significance level, respectively.

No.obs (n)=28, R-Squared=84%, Adjusted R-squared=79%, D.W=1.98, Prob (F-statistics) =0.000001, F-statistics=15.27.

3.4.3 Empirical Results and Interpretations

The OLS estimation results are as shown in table no.2 with the R-squared of 0.84 which implies that 84 percent of variation in FDI is explained by the model while the remaining is explained by other factors not included in the model. The general fitness of the model is good as indicated by the Probability (F-statistics) of 0.000001 and the high value of the F-statistics which is 15.27 while the value of Durbin Watson D.W was (1.98) which was also significant to confirm that the model is not serially correlated.

The test also shows that some variables were stationary at levels **I (0)** while others were only stationary after the first difference **I (1)**. In that case all the variables which were not stationary at levels were differentiated in order to be stationary and apply the OLS techniques for estimation.

The result shows that only four variables were significant with the right sign as hypothesized conforming to the economic theories; these variables were the market size (lnRGDP), infrastructure development (lnINFRAR) and Corruption (lnCORUP) and GDP growth (lnGDPGR). Other variables such as political stability, Real exchange rate had the right sign as predicted except human capital development which had a negative sign contrary to our prior expectation but they were all not significant on the inflow of FDI.

The estimated result shows that four of the variable namely lnINFRAR (0.0160), lnGDPGR (0.0005), lnRGDP (0.0079) and lnCORUP (0.0009) are significant at one percent level. All the four variables had the signs as expected and conform to the economic theories.

The implication of the variables may be as follows: with the infrastructure development (lnINFRAR) having a coefficient of 3.64 this may imply that an increase in the infrastructure development by 1 percent will lead to an increase of FDI by 3.64 percent. This result is consistent with the results found by other studies such as that of Shawa M. (2014), Xiao Ling Huang et al (2014) Vijayakumar et.al (2010), Bellak et.al (2008), Nguyen and Nguyen (2007), Banga (2003) etc.

GDP growth (lnGDPGR) had a coefficient of 0.49 which implies that an increase in GDP growth by 1 percent will lead to an increase of FDI by 0.49 percent. This result is consistent with the results found by other studies such as Bandera and White (1968), Lunn (1980), Culem (1988), Schneider and Frey (1985), and Billington (1999).

Market size (lnRGDP) had a coefficient of 4.34 which implies that an increase in the Market size in Thailand may lead to an increase in FDI by 4.34 percent this results is consistent with the results found by other studies by Shawa M.J (2014), Yang et al (2000), Nguyen and Nguyen (2007), Kristjandottir (2005), Masayuki and Ivohasina (2005), Laabas and Abdmoulah (2008), Bellak et.al (2008), Kimino et.al (2007), Yang et al (2000) who found that market size is an important factor on the inflow of FDI.

While Corruption (lnCORUP) had a coefficient of 4.38 which implies that an increase in the level of corruption may lead to a deterioration of FDI by 4.38 percent. This results is consistent with the results found by Gastanaga et al. (1998) and Hines (1995) but contrary to that study by Wheeler and Mody (1992) found no significant relationship between FDI and corruption.

The level of DW was satisfactory i.e. (1.98) in the model indicating the no presence of serial correlation in our model hence this model is good and that can be used for policy making in Thailand.

4.0 Conclusion, Policy Recommendations and Further Research

4.1 Conclusion

The high fluctuation level of (FDI) in Thailand between the years 1988-2015 are the key reason for conducting this study. This study has analyzed FDI and its determinants using the Ordinary least square (OLS) method, the general results indicates that the main determinants of FDI in Thailand are the, infrastructure development (lnINFRAR), Market size (lnRGDP), Corruption (lnCORUP) and GDP growth (lnGDPGR) which were all significant at 1 percent level and had sign as expected basing on economic theories. These findings are in line with many other previous studies such as that of Shawa M.J (2014) in his study of FDI in Tanzania who discovered the market size, infrastructure development, GDP growth were an important factor in attracting FDI.

Other studies such as Yang et al (2000), Nguyen and Nguyen (2007), Kristjandottir (2005), Masayuki and Ivohasina (2005), Laabas and Abdmoulah (2008), Bellak et.al (2008), Kimino et.al (2007), who found that market size is an important factor on the inflow of FDI. Studies by Xiao Ling Huang et al (2014) Vijayakumar et.al (2010), Bellak et.al (2008), Banga (2003) who also found that the infrastructure was a significant factor on FDI. Studies by Bandera and White (1968), Lunn (1980), Culem (1988), Schneider and Frey (1985), and Billington (1999) discovered that GDP growth had a significant effect on FDI while studies by Gastanaga et al. (1998) and Hines (1995) also found a significant relationship between FDI and corruption but it was contrary to that study by Wheeler and Mody (1992) which found no significant relationship between FDI and corruption. This study makes contribution to the existing literature in using more recent data particularly for Thailand.

4.2 Policy Suggestions and Further Research Areas

It has been clear from the results above that the infrastructure development (lnINFRAR), Market size (lnRGDP), Corruption (lnCORUP) and GDP growth (lnGDPGR) are the most important factors in influencing FDI inflows into Thailand. Therefore the Thai government is recommended to expand its market size, improve its infrastructure level, boost its economic growth rate and finally the government should curb the level of corruption because the study shows that high level of corruption in Thailand discourages FDI inflows to its economy.

This study is limited to only one country of Thailand and applied a very simple ordinary least square

method (OLS) as an estimation method for about 28 years duration of study.

In recognizing this limitation, therefore more future studies on the related subject is needed by applying other advanced techniques in analyzing the data and increasing the number of years of study. This will enable us getting most meaningful and reliable results. For example in this study some other relevant variables were not used due to the availability problem of data for some years hence the results in this study should be interpreted with care until further studies are conducted and use other reliable econometric techniques.

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